

Name: _____

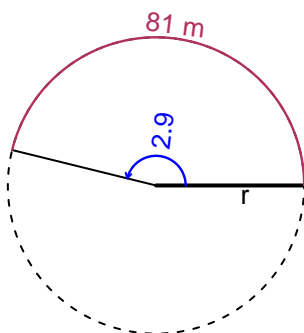
Date: _____

Trig Final (TEST v663)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

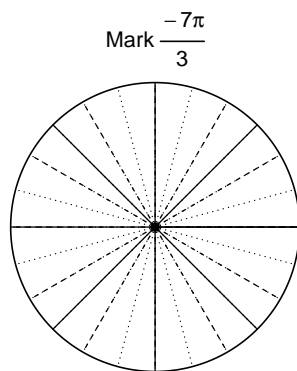
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 2.9 radians. The arc length is 81 meters. How long is the radius in meters?

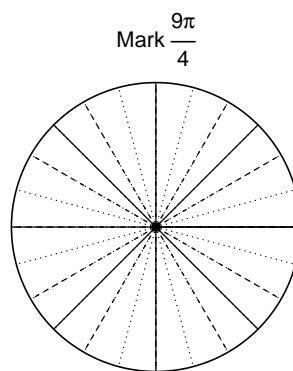


Question 2

Consider angles $-\frac{7\pi}{3}$ and $\frac{9\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(-\frac{7\pi}{3}\right)$ and $\cos\left(\frac{9\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\sin(-7\pi/3)$



Find $\cos(9\pi/4)$

Question 3

If $\tan(\theta) = \frac{-72}{65}$, and θ is in quadrant IV, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with a midline at $y = 7.85$ meters, a frequency of 2.34 Hz, and an amplitude of 6.12 meters. At $t = 0$, the mass is at the minimum height. Write an equation to model the height (y in meters) as a function of time (t in seconds).